Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of:	)	
	)	
Carrier Current Systems, Including Broadband	)	
Over Power Line Systems	)	**ET Docket No. 04-37**
	)	
Amendment of Part 15 Regarding New	)	
Requirement and Measurement Guidelines for	)	
Access Broadband Over Power Line Systems	)	

Comment of Peter D. Baskind,
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I. Introduction.

A. Background.

Before the Federal Communications Commission is rulemaking regarding an important question. The Commission is considering the future of so-called Broadband Over Power Lines, or "BPL," and has issued a Notice of Proposed Rulemaking under the above-captioned Docket Number. BPL, as the Notice states, is a carrier current system, traveling over low and medium voltage power lines, utilizing radio frequency in the High Frequency Spectrum.[1]

To be sure, this has been a very contentious issue. Stakeholders on both sides of the issue, either willingly or unwillingly, have communicated overstated or incorrect information regarding this new technology. This Commenter understands the necessity

[1] *See Carrier Current Systems, including Broadband Over Powerline Systems*, ET Docket No. 03-104 (Feb. 23, 2004) at ¶ 3. For the sake of word economy, a full discussion of the technology is omitted from this Comment. The description of the Medium in the Notice is assumed to be correct.

of perspective in this issue. Easy provision of new technologies, including BPL, should be encouraged. This must, however, be a balanced approach, ensuring no parties are given short shrift.

Traditionally carrier current systems such as BPL have operated below 2 Mhz.[2] Under the anticipated new regime, BPL systems would operate on frequencies as high as 50 Mhz, or even higher. Such a wide swath of bandwidth impacts many, many users and services. Most notably among these services include important public service two-way communications,[3] international and other long-distance High Frequency ("H.F.") broadcasting, amateur radio services, ship-to-shore and aeronautical long-distance HF communications, long-distance data transmissions, and radio astronomy, just to name a few.[4] Above the 50 Mhz amateur radio band, V.H.F. television channel 2 may be affected, should BPL extend as high as 80 Mhz, as some plans expect.[5]

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[2] *See id.* at 5.

[3] The stretch of bandspace between 30 Mhz and 50 Mhz, almost a forgotten band by many, contains some services of particular importance in the "Post 9-11 World." Those services include Coast Guard, Army, General United States Government, Forestry, United States Dept. of Agriculture, National Park Service, numerous local fire departments, local law enforcement, United States Dept. of the Interior, United States Dept. of Energy, local power and utility services, etc. For a comprehensive list with specific frequencies, *see* http://www.columbia.edu/~fuat/cuarc/fcc-bandplan.html. Most of these services are base to mobile, or mobile to mobile services.

[4] The FCC in its notice offers a similar list. It includes users such as, "fixed, land mobile, aeronautical mobile, maritime mobile, radiolocation, broadcast radio, amateur radio terrestrial and satellite, and radio-astronomy." *See id*. at ¶ 5.

[5] Impact upon services above the six-meter ham band are beyond the scope of this Comment. Those with specific knowledge and interest in the band are better qualified to comment about the effects on TV channel two.

B. History of BPL to Date.

Most will agree that the prospect of bringing easy access to broadband Internet to the masses is an exciting idea. Access to the Worldwide Web, e-mail, and other Internet options are very useful, and are indeed enhanced as bandwidth increases. That notwithstanding, we must be circumspect in bringing this about, if BPL will hinder other important communications media, such as those on H.F.

Reviews have been, to say the least, mixed on the impact of BPL. The Japanese have simply passed on using BPL in their country as its impact upon licensed services was considered to be too great, and mitigation techniques were found lacking.[6] Perhaps, even more importantly, the National Telecommunications and Information Administration, an Executive Branch agency within the Department of Commerce, the President's principal adviser on domestic and international telecommunications policy, expressed concern about the interference BPL might cause upon the communications within their authority. Writing to the Commission in 2003, the NTIA stated that while it was excited about the possibilities of BPL, it had, "broad concerns with radiated emission limits and other measures that may be needed to protect [its transmissions].[7] Subsequent to the Summer 2003 filing, the NTIA began extensive studies regarding the impact of BPL on their frequencies. The resulting study has not yet been issued, yet the BPL proceeding moves forward.

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[6] *See* http://www.soumu.go.jp/joho_tsusin/eng/Releases/Telecommunications/news020809_3.html.

[7] *See* Comments of the National Telecommunications and Information Administration, ET Docket No. 03-104. The NTIA has authority over a stunning number of frequencies. According to the filing, federal government agencies have over eighteen thousand (18,000) frequency assignments in the 1.7 - 80 MHz spectrum in which BPL systems may unintentionally radiate. These frequencies are coordinated through the NTIA. *See id*.

Members of the Amateur Radio Community have also felt threatened by the possible extensive roll-out of BPL. Far from being merely a plaything of hobbyists, amateur radio provides a valuable service of emergency communications and electronic experimentation that the Federal Communications Commission has often applauded.[8] In fact, the Commission has even gone as far to write this into its amateur radio rules.[9] It follows, then, that negative impact of BPL upon the amateur radio service should be of special concern to the Commission. In fact, even the Commission's most vocal advocate of development of BPL, Kathleen Q. Abernathy, has stated that interference to the Amateur Radio Service, "is something that will have to be addressed before any mass market deployment can occur."[10]

In light of the clear agreement from all parties, from the Commission to the NTIA to the Amateur Community, it is obvious that should BPL enjoy mass usage, great care should be taken to ensure mitigation of interference to users of the bandspace. As will be discussed below, the FCC's Notice of Proposed Rulemaking does not fully address concerns all agree are reasonable. More must be done.

C. Commenter

Commenter Peter D. Baskind is a resident of Germantown, Tennessee. He is an Extra-Class amateur radio licensee holder operating under call sign N4LI. Previous call signs held by Baskind are: KG4OGX, AG4KI, and ZF2PB. Baskind is a licensed

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[8] *See, e.g.*, *In the Matter of Amendment of Parts 2 and 97 of the Commission's Rules to Create a Low Frequency Allocation for the Amateur Radio Service*, 17 FCC Rcd. 8954 (2002) (citing 47 C.F.R. § 97.1).

[9] *See id*.

[10] *See* FCC's Abernathy Acknowledges Amateur Radio BPL Concerns, http://www.arrl.org/news/stories/2004/01/23/3/?nc=1 Jan. 23, 2004.

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While Baskind is a member of several amateur radio organizations, he submits this Comment in his personal capacity only.

II. Concerns and Argument.

A. Basic Assumptions.

Full discussion of BPL requires a tremendous amount of technical study and data. Several organizations including the American Radio Relay League ("ARRL") and the NTIA have either begun extensive testing and modeling of the issue, or have submitted findings to the Commission. Commenter has no illusions that he can add much to the technical analysis of these organizations. Commenter assumes their information follows proper method, and is submitted in good faith. Therefore, Commenter urges the Commission to give the studies submitted by these groups the attention they deserve.

While study of the technical data is highly important, consideration of the BPL question should not stop there. There are issues included in the Commission's Notice of Proposed Rulemaking that require further comment. It is those issues that Commenter Baskind attempts to illuminate.

B. BPL and Part 15

Despite the Commission's decision to keep BPL within Part 15, Commenter cannot help but wonder if Part 15 is enough to protect the amateur radio service. BPL is not a baby monitor, cordless phone, or narrow carrier current device – the sort of

intentional radiators envisioned in Part 15. BPL is a system utilizing giant uninsulated radiators perhaps miles long with the possibility of impacting entire areas and perhaps millions of people. The Commission must remain vigilant in protecting the public from possible harm. Stringent enforcement of Part 15's interference guidelines will be paramount. In most applications, no interference in amateur bands is acceptable; a "zero tolerance" policy must be enforced.

Commenter's concern in this case is only enhanced by language within the Commission's Notice of Proposed Rulemaking. In earlier comments to the FCC on the BPL issue, Commenter ARRL noted:

> amateurs use very sensitive receivers and high gain outdoor antennas that could be located in close proximity to electric power lines. ARRL submits that 53% of amateur respondents to a survey it conducted indicated that they deploy outdoor antennas located less than 30 meters from overhead power lines and that the current Part 15 limits are not sufficient to protect against interference in this situation.[11]

This argument was rejected wholesale by the Commission. The Notice of Proposed Rulemaking states, "we note that ARRL acknowledges that noise from power lines, absent any Access BPL signals, already presents a significant problem for amateur communications. We therefore would expect that, in practice, many amateurs already orient their antennas to minimize the reception of emissions from nearby electric power lines."[12] This argument is illogical, and stands ARRL's argument on its head. This thinking, in effect, penalizes amateurs for good antennas. It also implies two important and disturbing points: first, it hints that BPL will indeed interfere with amateur bands,

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[11] *See Carrier Current Systems, including Broadband Over Powerline Systems*, ET Docket No. 03-104 (Feb. 23, 2004) at ¶ 14.

[12] *See id.* at ¶ 35. This language raises another interesting issue. The Commission is stating here that utilities are already interfering with amateur radio. Yet, the Commission seems unconcerned. One can only hope that the Commission will be no less impressed when complaints of BPL noise begin filtering in after BPL systems begin operation.

and, perhaps more importantly, it is incumbent on the amateur – not the utility – to mitigate the interference by aiming antennas away from the offending radiator. It also carries the expectation that the receiving amateur station does not want to receive signals emanating from the same direction as the BPL device. This seems to be the very definition of "harmful interference." If Part 15 rules were to be stringently enforced, why would an amateur operator need to turn his antennas away from the radiator?

C. Harmful Interference.

In its Notice of Proposed Rulemaking, the Commission opted to keep BPL within the regime of FCC Part 15 rules.[13] This was, of course, a correct decision, although it may not be enough to mitigate problems by itself.[14] Removing BPL from Part 15 would essentially make an "open season" on the H.F. bands. As the Notice of Proposed Rulemaking notes, "all unlicensed devices operating under Part 15 are subject to the condition that they not cause harmful interference and that they cease operation if they do cause such interference."[15] But what the Notice fails to take into account is what "harmful interference" actually is relative to BPL.

Under current Part 15 rules, "Harmful Interference" is defined as [a]ny emission, radiation or induction that endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunications service operating in accordance with this chapter."[16] Yet, even

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[13] *See id*. at ¶ 34.

[14] *See id*. at ¶ 5

[15] *See id*. at ¶ 34 (citing 47 C.F.R. § 15.5(b)).

[16] 47 C.F.R. § 15.5(m)

with this seemingly comprehensive definition, purveyors of BPL are intentionally trying to redefine harmful interference, or at least confuse the issue by making the definition a moving target. The FCC should be very concerned by this trend.

Progress Energy Corporation (PEC) is current "testing" a BPL system in Raleigh, North Carolina.[17] Seemingly tired of trying to quiet their HF emissions, PEC has simply decided to call the interference handled, and Part 15 satisfied. Their assertions are untrue. Monitors of the area show, even in areas that have been addressed for interference, that some interference still exists.[18] Further, in areas with no hams, BPL emissions are quite loud indeed. But, the most concerning issue in PEC's cavalier attitude toward HF interference is PEC's almost total disregard of mobile operations. According to the utility, interference to mobile operations is merely transitory, and basically should be ignored.[19] This is chilling, indeed.

It is not up to the BPL provider to define Harmful Interference as it sees fit. That is an FCC matter. Amateur operators often receive signals just above the noise floor. Therefore, *any interference is harmful*, as it may cover up such a weak signal. Commenter is concerned that wars of semantics will ensue with parties arguing whether noise caused by BPL is indeed harmful. The Commission should be clear that BPL providers may cause *no interference* to the amateur service, and must shut systems down

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[17] *See North Carolina Utility Draws "Line in the Sand" on BPL Interference Abatement*, http://www.remote.arrl.org/news/stories/2004/04/22/2/?nc=1.

[18] *See id.*

[19] *See id*. Commenter is, frankly, shocked that a utility in experimentation phase with pending rulemaking before the Commission would display such a reckless disregard for current rules, and the problems it is manufacturing. One can only wonder what the utility's attitude will be once rulemaking is over, and the company has less to lose.

if they cause interference.[20] The final rule on BPL must make clear that all amateur operations, regardless of how useful they are deemed by the BPL purveyors, must be interference-free.[21]

D. Further Recommendations

If Amateur Radio and BPL are to coexist peacefully, it will be important that the Commission establish certain guidelines to mitigate the expected interference issues that will surface. Amateurs, and other HF users, must have easy access to information concerning BPL providers. Therefore, the FCC should require the establishment of a database of all BPL providers. Such database would be best served with an on-line search engine. The cost of such a database, of course, should be borne by the BPL providers themselves. Requirement of Public Notice prior to deployment of a BPL system would also be a positive step. Such Notice may be required in local papers commonly used for legal notice, or direct mail to licensed users in the utility's service area might also be employed.

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[20] While keeping BPL under Part 15 is a positive decision, it may not be the panacea that the Commission seems to believe. In the Notice of Proposed Rulemaking, the FCC states, "In this regard, we note that hundreds of kinds of unlicensed devices are successfully operating under the current Part 15 limits without causing harmful interference to licensed operations." *See id*. at ¶ 34. This reliance on past experience with Part 15 devices is misguided. Most Part 15 devices operate in less populated areas than the HF spectrum. Baby monitors, for instance, operate near 49 Mhz, where there is little interference. BPL is planned for use on crowded bands with numerous users. Further, BPL uses relatively untested technology with unshielded radiating devices stretching for miles. Radiation from other Part 15 devices is more predictable. Certainly, current Part 15 devices are not analogous to this massive system.

[21] Interference is often a two-way street. Under FCC rules, Part 15 devices must accept all interference. This, doubtless, may become a major battleground issue. To date, there have been no comprehensive studies on the affect of amateur transmissions on BPL devices. The day will come when legal transmissions by licensed amateurs, the primary users on most HF allocations, will cause an interruption in service on a BPL system. The BPL provider will surely seek relief from the FCC or even local authorities. It will be incumbent on the FCC to repel these arguments. Necessity and expense should not exempt BPL providers from this fundamental liability of Part 15 status. One step that may be taken to blunt this potential problem is a requirement that BPL providers include a clause in the service contracts informing customers of the potential interference to their broadband service from licensed users of spectrum.

Access to data is not enough. BPL providers should also be required to provide a toll-free, 24-hour telephone line for aggrieved amateurs, and other users, to address interference complaints. The FCC should further require that BPL providers respond to complaints within a finite amount of time, perhaps 24 hours. Regulations should suggest a set time in which the interference be fully mitigated; if the deadline is missed, the BPL system responsible for the radiation be turned off.

III. Conclusion

BPL is a flawed technology requiring the insertion of the "square peg" of RF into the "round hole" of electrical transmission lines. It may well be a technology doomed to fail. But, the amateur community is not trying to be obstructionist; it is merely attempting to protect its spectrum, and wishes to be part of the process of making BPL a reasonable option, if possible. The amateur radio community and BPL, should the system be widely implemented, must learn to live together. In order for that to happen, the FCC will have to make clear that it is amateur radio, not BPL, that is the party to be protected. Failing that, BPL, a system of dubious technical standards, will sound the death knell for amateur radio, a service that has provided public service and experimentation since the early 1900s.

Bringing broadband to the masses is a positive goal. It just may be that the technology in place in BPL is either not fully developed, or fundamentally flawed. It is up to the Commission to ensure that BPL does not render 30 or more megahertz of spectrum useless. Spectrum is, after all, a finite resource.

Respectfully submitted,

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